SPEC CPU®2017 Floating Point Speed Result
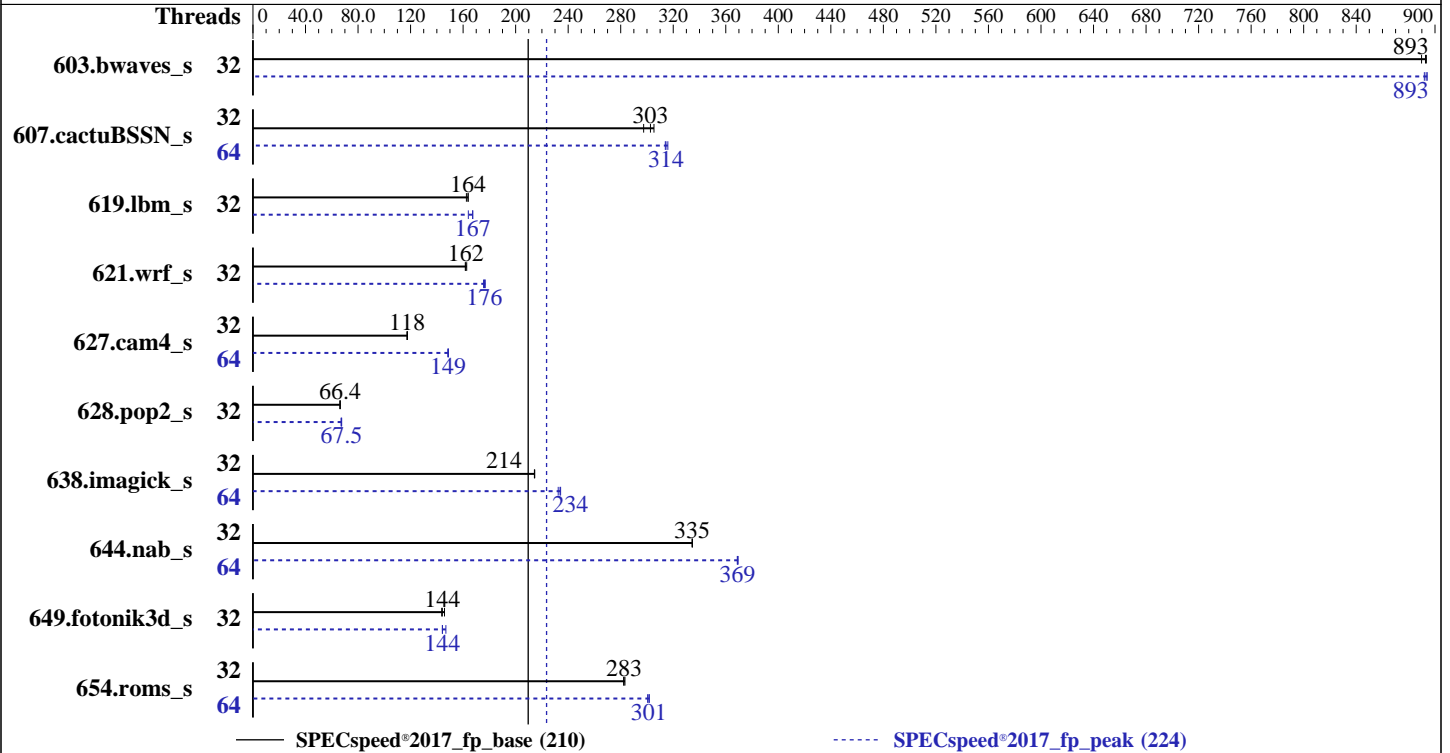
Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)

(Tyrone Camarero SDA200A2R-424)
(3.00 GHz, AMD EPYC 9124)

$SPECspeed®2017\_fp\_base = 210$

$SPECspeed®2017\_fp\_peak = 224$

CPU2017 License: 6042
Test Sponsor: Netweb Pte Ltd
Tested by: Tyrone Systems

Test Date: Jan-2024
Hardware Availability: Jun-2023
Software Availability: Nov-2023

Benchmark	Threads	base	peak
603.bwaves_s	32 /	893	
			893
607.cactuBSSN_s	32	303	
	64		314
619.lbm_s	32	164	
			167
621.wrf_s	32	162	
			176
627.cam4_s	32	118	
	64		149
628.pop2_s	32	66.4	
			67.5
638.imagick_s	32	214	
	64		234
644.nab_s	32	335	
	64		369
649.fotonik3d_s	32	144	
			144
654.roms_s	32	283	
	64		301

—— SPECspeed®2017_fp_base (210)   ----- **SPECspeed®2017_fp_peak (224)**

Hardware

CPU Name: AMD EPYC 9124
  Max MHz: 3700
  Nominal: 3000
Enabled: 32 cores, 2 chips, 2 threads/core
Orderable: 1,2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
  L2: 1 MB I+D on chip per core
  L3: 64 MB I+D on chip per chip, 16 MB shared / 4 cores
  Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 1 TB NVMe
Other: None

Software

OS: Ubuntu 20.04.4 LTS
    kernel version
    5.15.0-89-generic
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: Yes
Firmware: Version 1.6 released Nov-2023
File System: ext4
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: None
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.

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Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	32	66.3	890	66.0	893	**66.1**	**893**	32	66.0	894	**66.1**	**893**	66.1	892
607.cactuBSSN_s	32	**55.1**	**303**	54.6	305	56.0	297	64	52.8	316	53.1	314	**53.0**	**314**
619.lbm_s	32	**32.0**	**164**	32.0	164	32.2	163	32	31.3	167	31.9	164	**31.3**	**167**
621.wrf_s	32	81.8	162	**81.6**	**162**	81.3	163	32	75.3	176	74.8	177	**75.0**	**176**
627.cam4_s	32	75.4	118	75.6	117	**75.4**	**118**	64	59.6	149	59.7	148	**59.6**	**149**
628.pop2_s	32	**179**	**66.4**	179	66.2	179	66.4	32	176	67.5	177	67.1	**176**	**67.5**
638.imagick_s	32	**67.3**	**214**	67.2	215	67.3	214	64	62.1	232	**61.7**	**234**	61.6	234
644.nab_s	32	52.2	334	52.2	335	**52.2**	**335**	64	47.3	369	47.4	369	**47.4**	**369**
649.fotonik3d_s	32	**63.2**	**144**	62.5	146	63.4	144	32	63.2	144	**63.2**	**144**	62.1	147
654.roms_s	32	55.8	282	**55.7**	**283**	55.6	283	64	52.2	302	52.4	300	**52.2**	**301**
SPECspeed®2017_fp_base =		**210**												
SPECspeed®2017_fp_peak =		**224**												

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Notes

```
The AMD64 AOCC Compiler Suite is available at
http://developer.amd.com/amd-aocc/
```

Submit Notes

```
The config file option 'submit' was used.
'numactl' was used to bind copies to the cores.
See the configuration file for details.
```

Operating System Notes

```
'ulimit -s unlimited' was used to set environment stack size limit
'ulimit -l 2097152' was used to set environment locked pages in memory limit

runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty_ratio=8' run as root.
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.
To free node-local memory and avoid remote memory usage,
'sysctl -w vm.zone_reclaim_mode=1' run as root.
To clear filesystem caches, 'sync; sysctl -w vm.drop_caches=3' run as root.
To disable address space layout randomization (ASLR) to reduce run-to-run
variability, 'sysctl -w kernel.randomize_va_space=0' run as root.

To enable Transparent Hugepages (THP) only on request for base runs,
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To enable THP for all allocations for peak runs,
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
```

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Test Sponsor:	Netweb Pte Ltd	**Hardware Availability:**	Jun-2023
Tested by:	Tyrone Systems	**Software Availability:**	Nov-2023

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-63"
LD_LIBRARY_PATH = "/home/cpu2017/amd_speed_aocc400_znver4_A_lib/lib:"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOC_CONF = "oversize_threshold:0,retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "64"

Environment variables set by runcpu during the 603.bwaves_s peak run:
GOMP_CPU_AFFINITY = "0-31"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0-31"

Environment variables set by runcpu during the 621.wrf_s peak run:
GOMP_CPU_AFFINITY = "0-31"

Environment variables set by runcpu during the 627.cam4_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 628.pop2_s peak run:
GOMP_CPU_AFFINITY = "0-31"

Environment variables set by runcpu during the 638.imagick_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 644.nab_s peak run:
GOMP_CPU_AFFINITY = "0-63"

Environment variables set by runcpu during the 649.fotonik3d_s peak run:
GOMP_CPU_AFFINITY = "0-31"
PGHPF_ZMEM = "yes"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0 32 1 33 2 34 3 35 4 36 5 37 6 38 7 39 8 40 9 41 10 42 11 43 12 44 13 45 14 46 15 47
      16 48 17 49 18 50 19 51 20 52 21 53 22 54 23 55 24 56 25 57 26 58 27 59 28 60 29 61 30 62 31 63"
```

General Notes

```
Binaries were compiled on a system with 2x AMD EPYC 9174F CPU + 1.5TiB Memory using RHEL 8.6

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
is mitigated in the system as tested and documented.
```

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Tested by: Tyrone Systems

Test Date: Jan-2024
Hardware Availability: Jun-2023
Software Availability: Nov-2023

Platform Notes

```
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on amd2-Super-Server Tue Jan 23 13:56:54 2024

SUT (System Under Test) info as seen by some common utilities.

-----------------------------------------------------------
Table of contents
-----------------------------------------------------------
 1. uname -a
 2. w
 3. Username
 4. ulimit -a
 5. sysinfo process ancestry
 6. /proc/cpuinfo
 7. lscpu
 8. numactl --hardware
 9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 245 (245.4-4ubuntu3.20)
12. Failed units, from systemctl list-units --state=failed
13. Services, from systemctl list-unit-files
14. Linux kernel boot-time arguments, from /proc/cmdline
15. sysctl
16. /sys/kernel/mm/transparent_hugepage
17. /sys/kernel/mm/transparent_hugepage/khugepaged
18. OS release
19. Disk information
20. /sys/devices/virtual/dmi/id
21. dmidecode
22. BIOS
-----------------------------------------------------------


-----------------------------------------------------------
1. uname -a
  Linux amd2-Super-Server 5.15.0-91-generic #101~20.04.1-Ubuntu SMP Thu Nov 16 14:22:28 UTC 2023 x86_64
  x86_64 x86_64 GNU/Linux


-----------------------------------------------------------
2. w
   13:56:54 up 20:46,  1 user,  load average: 6.02, 6.20, 3.65
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  root     tty1     -                Mon17    3:36m  1.61s  0.49s /bin/bash ./amd_speed_aocc400_znver4_A1.sh


-----------------------------------------------------------
3. Username
  From environment variable $USER:  root


-----------------------------------------------------------
4. ulimit -a
  time(seconds)        unlimited
  file(blocks)         unlimited
  data(kbytes)         unlimited
  stack(kbytes)        unlimited
  coredump(blocks)     0
  memory(kbytes)       unlimited
  locked memory(kbytes) 2097152
  process              4126174
  nofiles              1024
```

(Continued on next page)

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Platform Notes (Continued)

```
  vmemory(kbytes)       unlimited
  locks                 unlimited
  rtprio                0

    -----------------------------------------------------------
5. sysinfo process ancestry
 /sbin/init splash
 /bin/login -p --
 -bash
 python3 ./run_amd_speed_aocc400_znver4_A1.py
 /bin/bash ./amd_speed_aocc400_znver4_A1.sh
 runcpu --config amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 fpspeed
 runcpu --configfile amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 --nopower
   --runmode speed --tune base:peak --size test:train:refspeed fpspeed --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.002/templogs/preenv.fpspeed.002.0.log --lognum 002.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017

    -----------------------------------------------------------
6. /proc/cpuinfo
   model name      : AMD EPYC 9124 16-Core Processor
   vendor_id       : AuthenticAMD
   cpu family      : 25
   model           : 17
   stepping        : 1
   microcode       : 0xa10113e
   bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass srso
   TLB size        : 3584 4K pages
   cpu cores       : 16
   siblings        : 32
   2 physical ids (chips)
   64 processors (hardware threads)
   physical id 0: core ids 0-3,8-11,16-19,24-27
   physical id 1: core ids 0-3,8-11,16-19,24-27
   physical id 0: apicids 0-7,16-23,32-39,48-55
   physical id 1: apicids 64-71,80-87,96-103,112-119
 Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
 virtualized systems.  Use the above data carefully.

    -----------------------------------------------------------
7. lscpu

From lscpu from util-linux 2.34:
 Architecture:           x86_64
 CPU op-mode(s):         32-bit, 64-bit
 Byte Order:             Little Endian
 Address sizes:          52 bits physical, 57 bits virtual
 CPU(s):                 64
 On-line CPU(s) list:    0-63
 Thread(s) per core:     2
 Core(s) per socket:     16
 Socket(s):              2
 NUMA node(s):           2
 Vendor ID:              AuthenticAMD
 CPU family:             25
 Model:                  17
 Model name:             AMD EPYC 9124 16-Core Processor
 Stepping:               1
 Frequency boost:        enabled
 CPU MHz:                1500.000
```

(Continued on next page)

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Platform Notes (Continued)

```
    CPU max MHz:                        3711.9141
    CPU min MHz:                        1500.0000
    BogoMIPS:                          5999.73
    Virtualization:                    AMD-V
    L1d cache:                         1 MiB
    L1i cache:                         1 MiB
    L2 cache:                          32 MiB
    L3 cache:                          128 MiB
    NUMA node0 CPU(s):                 0-15,32-47
    NUMA node1 CPU(s):                 16-31,48-63
    Vulnerability Gather data sampling: Not affected
    Vulnerability Itlb multihit:       Not affected
    Vulnerability L1tf:                Not affected
    Vulnerability Mds:                 Not affected
    Vulnerability Meltdown:            Not affected
    Vulnerability Mmio stale data:     Not affected
    Vulnerability Retbleed:            Not affected
    Vulnerability Spec rstack overflow: Mitigation; safe RET
    Vulnerability Spec store bypass:   Mitigation; Speculative Store Bypass disabled via prctl and seccomp
    Vulnerability Spectre v1:          Mitigation; usercopy/swapgs barriers and __user pointer sanitization
    Vulnerability Spectre v2:          Mitigation; Retpolines, IBPB conditional, IBRS_FW, STIBP always-on, RSB
                                       filling, PBRSB-eIBRS Not affected
    Vulnerability Srbds:               Not affected
    Vulnerability Tsx async abort:     Not affected
    Flags:                             fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                                       clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp
                                       lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf
                                       rapl pni pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2 x2apic
                                       movbe popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic
                                       cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw ibs skinit wdt tce
                                       topoext perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb cat_l3
                                       cdp_l3 invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmmcall
                                       fsgsbase bmi1 avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq
                                       rdseed adx smap avx512ifma clflushopt clwb avx512cd sha_ni avx512bw
                                       avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc
                                       cqm_mbm_total cqm_mbm_local avx512_bf16 clzero irperf xsaveerptr rdpru
                                       wbnoinvd amd_ppin cppc arat npt lbrv svm_lock nrip_save tsc_scale
                                       vmcb_clean flushbyasid decodeassists pausefilter pfthreshold avic
                                       v_vmsave_vmload vgif v_spec_ctrl avx512vbmi umip pku ospke avx512_vbmi2
                                       gfni vaes vpclmulqdq avx512_vnni avx512_bitalg avx512_vpopcntdq la57
                                       rdpid overflow_recov succor smca fsrm flush_l1d


  From lscpu --cache:
      NAME ONE-SIZE ALL-SIZE WAYS TYPE         LEVEL
      L1d       32K       1M    8 Data             1
      L1i       32K       1M    8 Instruction      1
      L2         1M      32M    8 Unified          2
      L3        16M     128M   16 Unified          3


    -----------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 2 nodes (0-1)
    node 0 cpus: 0-15,32-47
    node 0 size: 515621 MB
    node 0 free: 514002 MB
    node 1 cpus: 16-31,48-63
    node 1 size: 515996 MB
    node 1 free: 514958 MB
    node distances:
```

(Continued on next page)

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Platform Notes (Continued)

```
  node   0   1
    0:  10  32
    1:  32  10


   -----------------------------------------------------------
9. /proc/meminfo
   MemTotal:       1056377596 kB


   -----------------------------------------------------------
10. who -r
   run-level 3 Jan 22 17:10


   -----------------------------------------------------------
11. Systemd service manager version: systemd 245 (245.4-4ubuntu3.20)
   Default Target  Status
   multi-user      degraded


   -----------------------------------------------------------
12. Failed units, from systemctl list-units --state=failed
     UNIT                   LOAD   ACTIVE SUB    DESCRIPTION
   * fwupd-refresh.service loaded failed failed Refresh fwupd metadata and update motd


   -----------------------------------------------------------
13. Services, from systemctl list-unit-files
   STATE            UNIT FILES
   enabled          ModemManager NetworkManager NetworkManager-dispatcher NetworkManager-wait-online
                    accounts-daemon anacron apparmor autovt@ avahi-daemon bluetooth console-setup cron cups
                    cups-browsed dmesg e2scrub_reap getty@ gpu-manager grub-common grub-initrd-fallback
                    irqbalance kerneloops keyboard-setup network-manager networkd-dispatcher ondemand openvpn
                    pppd-dns rsync rsyslog secureboot-db setvtrgb snapd ssh sshd switcheroo-control syslog
                    systemd-pstore systemd-resolved systemd-timesyncd thermald ua-reboot-cmds udisks2 ufw
                    unattended-upgrades whoopsie wpa_supplicant
   enabled-runtime  netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
   disabled         acpid brltty console-getty debug-shell ipmievd openvpn-client@ openvpn-server@ openvpn@
                    rtkit-daemon serial-getty@ speech-dispatcher speech-dispatcherd
                    systemd-boot-check-no-failures systemd-network-generator systemd-networkd
                    systemd-networkd-wait-online systemd-time-wait-sync upower wpa_supplicant-nl80211@
                    wpa_supplicant-wired@ wpa_supplicant@
   generated        apport ipmidrv openipmi
   indirect         display-manager lightdm saned@ spice-vdagent spice-vdagentd uuidd
   masked           alsa-utils cryptdisks cryptdisks-early hwclock pulseaudio-enable-autospawn rc rcS saned
                    sudo x11-common


   -----------------------------------------------------------
14. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-5.15.0-91-generic
   root=UUID=1ae71a13-cac0-48f6-b6e6-e15e5e687f57
   ro
   quiet
   splash
   vt.handoff=7


   -----------------------------------------------------------
15. sysctl
   kernel.numa_balancing            1
   kernel.randomize_va_space        0
   vm.compaction_proactiveness      20
   vm.dirty_background_bytes        0
   vm.dirty_background_ratio        10
   vm.dirty_bytes                   0
```

(Continued on next page)

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Platform Notes (Continued)

```
   vm.dirty_expire_centisecs         3000
   vm.dirty_ratio                       8
   vm.dirty_writeback_centisecs       500
   vm.dirtytime_expire_seconds      43200
   vm.extfrag_threshold               500
   vm.min_unmapped_ratio                1
   vm.nr_hugepages                      0
   vm.nr_hugepages_mempolicy            0
   vm.nr_overcommit_hugepages           0
   vm.swappiness                        1
   vm.watermark_boost_factor        15000
   vm.watermark_scale_factor           10
   vm.zone_reclaim_mode                 1


   ----------------------------------------------------------------
16. /sys/kernel/mm/transparent_hugepage
   defrag          [always] defer defer+madvise madvise never
   enabled         [always] madvise never
   hpage_pmd_size  2097152
   shmem_enabled   always within_size advise [never] deny force


   ----------------------------------------------------------------
17. /sys/kernel/mm/transparent_hugepage/khugepaged
   alloc_sleep_millisecs   60000
   defrag                      1
   max_ptes_none             511
   max_ptes_shared           256
   max_ptes_swap              64
   pages_to_scan            4096
   scan_sleep_millisecs    10000


   ----------------------------------------------------------------
18. OS release
   From /etc/*-release /etc/*-version
   os-release Ubuntu 20.04.4 LTS


   ----------------------------------------------------------------
19. Disk information
SPEC is set to: /home/cpu2017
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/nvme0n1p2 ext4  938G   20G  871G   3% /


   ----------------------------------------------------------------
20. /sys/devices/virtual/dmi/id
   Vendor:         Tyrone Systems
   Product:        Tyrone Camarero SDA200A2R-424
   Product Family: SMC H13
   Serial:         A509935X3C01325


   ----------------------------------------------------------------
21. dmidecode
   Additional information from dmidecode 3.2 follows.  WARNING: Use caution when you interpret this section.
   The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately
   determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the
   "DMTF SMBIOS" standard.
   Memory:
     8x NO DIMM NO DIMM
     16x Samsung M321R8GA0BB0-CQKZJ 64 GB 2 rank 4800
```

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Hardware Availability: Jun-2023
Software Availability: Nov-2023

Platform Notes (Continued)

```
      --------------------------------------------------------------
      22. BIOS
      (This section combines info from /sys/devices and dmidecode.)
        BIOS Vendor:       American Megatrends International, LLC.
        BIOS Version:      1.6
        BIOS Date:         11/16/2023
        BIOS Revision:     5.27
```

Compiler Version Notes

```
==============================================================================
C               | 619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------


==============================================================================
C++, C, Fortran | 607.cactuBSSN_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------


==============================================================================
Fortran         | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------


==============================================================================
Fortran, C      | 621.wrf_s(base, peak) 627.cam4_s(base, peak) 628.pop2_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------
```

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Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)

(Tyrone Camarero SDA200A2R-424)
(3.00 GHz, AMD EPYC 9124)

SPECspeed®2017_fp_base = 210

SPECspeed®2017_fp_peak = 224

CPU2017 License: 6042	**Test Date:** Jan-2024
Test Sponsor: Netweb Pte Ltd	**Hardware Availability:** Jun-2023
Tested by: Tyrone Systems	**Software Availability:** Nov-2023

Base Compiler Invocation

C benchmarks:
```
clang
```

Fortran benchmarks:
```
flang
```

Benchmarks using both Fortran and C:
```
flang clang
```

Benchmarks using Fortran, C, and C++:
```
clang++ clang flang
```

Base Portability Flags

603.bwaves_s: `-DSPEC_LP64`
607.cactuBSSN_s: `-DSPEC_LP64`
619.lbm_s: `-DSPEC_LP64`
621.wrf_s: `-DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64`
627.cam4_s: `-DSPEC_CASE_FLAG -DSPEC_LP64`
628.pop2_s: `-DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64`
638.imagick_s: `-DSPEC_LP64`
644.nab_s: `-DSPEC_LP64`
649.fotonik3d_s: `-DSPEC_LP64`
654.roms_s: `-DSPEC_LP64`

Base Optimization Flags

C benchmarks:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

Fortran benchmarks:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -DSPEC_OPENMP -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -Mrecursive
-funroll-loops -mllvm -lsr-in-nested-loop
```

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SPEC CPU®2017 Floating Point Speed Result
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Tyrone Systems
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(Tyrone Camarero SDA200A2R-424)
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SPECspeed®2017_fp_base = 210

SPECspeed®2017_fp_peak = 224

CPU2017 License: 6042		**Test Date:**	Jan-2024
Test Sponsor:	Netweb Pte Ltd	**Hardware Availability:**	Jun-2023
Tested by:	Tyrone Systems	**Software Availability:**	Nov-2023

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
```
-mllvm -reduce-array-computations=3 -zopt -fopenmp=libomp -lomp
-lamdlibm -lamdalloc -lflang
```

Benchmarks using both Fortran and C:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-enable-X86-prefetching -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

Benchmarks using Fortran, C, and C++:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000 -Mrecursive -funroll-loops
-mllvm -lsr-in-nested-loop -fopenmp=libomp -lomp -lamdlibm -lamdalloc
-lflang
```

Base Other Flags

C benchmarks:
```
-Wno-return-type -Wno-unused-command-line-argument
```

Fortran benchmarks:
```
-Wno-unused-command-line-argument
```

Benchmarks using both Fortran and C:
```
-Wno-return-type -Wno-unused-command-line-argument
```

Benchmarks using Fortran, C, and C++:
```
-Wno-return-type -Wno-unused-command-line-argument
```

SPEC CPU®2017 Floating Point Speed Result

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Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)

(Tyrone Camarero SDA200A2R-424)
(3.00 GHz, AMD EPYC 9124)

SPECspeed®2017_fp_base = 210

SPECspeed®2017_fp_peak = 224

CPU2017 License: 6042
Test Sponsor: Netweb Pte Ltd
Tested by: Tyrone Systems

Test Date: Jan-2024
Hardware Availability: Jun-2023
Software Availability: Nov-2023

Peak Compiler Invocation

C benchmarks:
```
clang
```

Fortran benchmarks:
```
flang
```

Benchmarks using both Fortran and C:
```
flang clang
```

Benchmarks using Fortran, C, and C++:
```
clang++ clang flang
```

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

```
619.lbm_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

```
638.imagick_s: Same as 619.lbm_s
```

```
644.nab_s: -m64 -Wl,-mllvm -Wl,-region-vectorize -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

Fortran benchmarks:

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)
https://www.spec.org/

Tyrone Systems
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(Tyrone Camarero SDA200A2R-424)
(3.00 GHz, AMD EPYC 9124)

SPECspeed®2017_fp_base = 210

SPECspeed®2017_fp_peak = 224

CPU2017 License: 6042　　　　　　　　　　　　　　　**Test Date:** Jan-2024
Test Sponsor: Netweb Pte Ltd　　　　　　　　　　**Hardware Availability:** Jun-2023
Tested by: Tyrone Systems　　　　　　　　　　　**Software Availability:** Nov-2023

Peak Optimization Flags (Continued)

603.bwaves_s: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-mllvm -Wl,-enable-X86-prefetching -DSPEC_OPENMP`
`-Ofast -march=znver4 -fveclib=AMDLIBM -ffast-math`
`-fopenmp -Mrecursive -mllvm -reduce-array-computations=3`
`-fvector-transform -fscalar-transform -fopenmp=libomp`
`-lomp -lamdlibm -lamdalloc -lflang`

649.fotonik3d_s: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-mllvm -Wl,-enable-X86-prefetching -DSPEC_OPENMP`
`-Ofast -march=znver4 -fveclib=AMDLIBM -ffast-math`
`-fopenmp -flto -Mrecursive`
`-mllvm -reduce-array-computations=3 -zopt -fopenmp=libomp`
`-lomp -lamdlibm -lamdalloc -lflang`

654.roms_s: `Same as 603.bwaves_s`

Benchmarks using both Fortran and C:

621.wrf_s: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast`
`-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp`
`-flto -fstruct-layout=9 -mllvm -unroll-threshold=50`
`-fremap-arrays -fstrip-mining`
`-mllvm -inline-threshold=1000`
`-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt`
`-O3 -Mrecursive -funroll-loops -mllvm -lsr-in-nested-loop`
`-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang`

627.cam4_s: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast`
`-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp`
`-flto -fstruct-layout=9 -mllvm -unroll-threshold=50`
`-fremap-arrays -fstrip-mining`
`-mllvm -inline-threshold=1000`
`-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt`
`-Mrecursive -fopenmp=libomp -lomp -lamdlibm -lamdalloc`
`-lflang`

628.pop2_s: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-mllvm -Wl,-enable-X86-prefetching -Ofast`
`-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp`

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SPECspeed®2017_fp_base = 210

SPECspeed®2017_fp_peak = 224

CPU2017 License: 6042
Test Sponsor: Netweb Pte Ltd
Tested by: Tyrone Systems

Test Date: Jan-2024
Hardware Availability: Jun-2023
Software Availability: Nov-2023

Peak Optimization Flags (Continued)

628.pop2_s (continued):
```
-flto -fstruct-layout=9 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-Mrecursive -fvector-transform -fscalar-transform
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

Benchmarks using Fortran, C, and C++:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Ofast -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=9
-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -finline-aggressive -mllvm -unroll-threshold=100
-Mrecursive -fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

Peak Other Flags

C benchmarks:
```
-Wno-return-type -Wno-unused-command-line-argument
```

Fortran benchmarks:
```
-Wno-unused-command-line-argument
```

Benchmarks using both Fortran and C:
```
-Wno-return-type -Wno-unused-command-line-argument
```

Benchmarks using Fortran, C, and C++:
```
-Wno-return-type -Wno-unused-command-line-argument
```

The flags files that were used to format this result can be browsed at
```
http://www.spec.org/cpu2017/flags/aocc400-flags.html
http://www.spec.org/cpu2017/flags/Tyrone-Platform-Settings-V1.2-Genoa-revC.html
```

You can also download the XML flags sources by saving the following links:
```
http://www.spec.org/cpu2017/flags/aocc400-flags.xml
http://www.spec.org/cpu2017/flags/Tyrone-Platform-Settings-V1.2-Genoa-revC.xml
```

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Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)

(Tyrone Camarero SDA200A2R-424)
(3.00 GHz, AMD EPYC 9124)

$SPECspeed®2017\_fp\_base = 210$

$SPECspeed®2017\_fp\_peak = 224$

CPU2017 License:	6042	**Test Date:**	Jan-2024
Test Sponsor:	Netweb Pte Ltd	**Hardware Availability:**	Jun-2023
Tested by:	Tyrone Systems	**Software Availability:**	Nov-2023

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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